Name of Organization: Minnesota Pollution Control Agency

Type of Organization: State

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Project Title: Ecosystem Protection for Minnesota's Lake Superior Coast

Project Category: Habitat (Ecological) Protection and Rest

Rank by Organization (if applicable): 1

Total Funding Requested ($): 120,000 **Project Duration:** 2 Years

Abstract:

Lake Superior's outstanding quality and wilderness characteristics are largely a consequence of its small industrial base and population centers. Changes in settlement patterns brought about by technological innovation, consumer behavior, and increases in tourism present significant challenges to the protection of Lake Superior and its coastal ecosystems. Duluth, which is the largest U.S. city on Lake Superior, is experiencing robust growth. Area homes sales went up 6.5% from 1998 to 1999. From 1990 to 1995, 50 new lodging establishments were built on Minnesota's Lake Superior shoreline. Tourism spending in Cook County increased by 143 percent in a four-year period from 1989 to 1993. This unprecedented development pressure is likely to accelerate even more rapidly once sanitary sewers service large areas of the shoreline.

This project focuses on developing a natural resource inventory (NRI) for Duluth and parts of the North Shore. The project has many purposes. One objective of this project is to simply provide policy makers and the public with an understanding of the role individual resources play within larger natural systems (e.g., watersheds, habitat corridors, etc.). Because of a lack of data, this understanding of how larger natural systems operate has been absent from most land use debates and decisions. Equally valuable, the timing of this project fits very well with comprehensive plan revisions underway in both Duluth and North Shore communities. Large parts of the NRI can be lifted and inserted directly into these comprehensive plans. Since comprehensive plans form the basis for zoning codes, the NRI will help provide stronger safeguards for protection of key natural resource values. An equally strong emphasis on outreach will insure that strong public support exists for these protections.

Geographic Areas Affected by the Project

States:

- [ ] Illinois
- [ ] Indiana
- [ ] Michigan
- [x] Minnesota
- [ ] New York
- [ ] Pennsylvania
- [ ] Wisconsin
- [ ] Ohio

Lakes:

- [x] Superior
- [ ] Huron
- [ ] Michigan
- [ ] Erie
- [ ] Ontario
- [ ] All Lakes

Geographic Initiatives:

- [ ] Greater Chicago
- [ ] NE Ohio
- [ ] NW Indiana
- [ ] SE Michigan
- [ ] Lake St. Clair

Primary Affected Area of Concern: St. Louis River, MN

Other Affected Areas of Concern:

For Habitat Projects Only:

Primary Affected Biodiversity Investment Area: Lake Superior Highlands/Isle Royale

Other Affected Biodiversity Investment Areas:

Problem Statement:

Lake Superior is considered the cleanest and most pristine of the Great Lakes system. While it would be inspiring to say that this conditions are the consequence of some enlightened management, the Lake's current condition is largely a consequence of a lightly populated watershed and small industrial base. However, recent changes in settlement patterns and tourism present significant challenges to the protection of Lake Superior and its coastal ecosystems. From 1990 to 1995, 50 new lodging establishments went up on Minnesota's coast. Tourism spending in Cook County increased by 143 percent in a four year period from 1989 to 1993. New golf courses, subdivisions, and shopping centers are announced routinely now in Duluth and the small cities that dot the coast. Plans to add new sewer service to major parts of the coast will likely fuel or accelerate this sprawling development pattern.

This project is an effort to catalogue key natural resources in Duluth and within the 19 mile corridor serviced by the new sewer system. The project has many purposes. One of these purposes is simply to provide policy makers and the public with an understanding of the role individual natural resources play within larger systems (e.g., watersheds, habitat corridors). Because of a lack of this basic information, an understanding of environmental trade-offs is almost entirely absent from land use decisions and debates. Awareness of the location and scarcity of these key natural resources (e.g., riparian corridors, trout streams, springs, groundwater recharge areas, fish spawing areas, etc.) makes it possible to accommodate growth and economic opportunities without undermining natural systems. This enlightened approach will help to reduce the adverserial nature of some land uses decisions and provide a measure of predictability to economic development plans.

Proposed Work Outcome:

Proposed Work - Action Plan

The natural resources inventory will be created in three phases. Each phase will provide stand alone sources of information. The following inventory materials will be used to develop educational materials, including a video which will expand the core NRI data:

· Creation of a Baseline Resource Needs Evaluation that accesses existing data sources for their potential incorporation into the NRI and outlines future data to be created. The data to be collected will be based on an outline of the proposed

structure of the inventory as developed by the volunteer Natural Resource Committee. It will serve as a goal statement for the NRI project as well as a tool to be used in the prioritization of data sources included. From the baseline information the natural resources components will be divided into interrelated units for assembly of data. Funding has been obtained for this portion of the project.

· Development of a "Library" of information on natural resources for Duluth and parts of the Lake Superior coast. The library will consist of separate interactive modules of information on natural resources areas (e.g.: geology, watershed, soils, cultural components,etc.- see listing under products). The current grant application seeks funding for this portion of the Natural Resources Inventory. The modules will be developed in stages by identifying existing information, digitizing information for GIS and computer application, and finally by determining voids in information. Based on gaps in coverage, the recommendation will be made for specific areas of future research. Information will be made available as hard copy maps, on CD, and through the Internet for access by interested personnel. Each module will provide a stand alone document of information on specific natural resources and ecosystem components. Modules will be developed using a GIS format to allow for the ability to superimpose habitat and natural resource data on a variety of base maps (e.g. zoning, infrastructure, ownership). The modular system will allow for the incorporation of modules developed through cooperating groups such as the Duluth Storm Water Utility, which is currently beginning the process of developing a surface water map as part of the Surface Water Plan for the City of Duluth. For development of each module of data, an advisory committee of local experts and interested citizens will be formed. The committee will provide input and assistance during the development stages and serve as a review group for the final module. The committees would be drawn from the University of Minnesota Duluth, government and regulatory agencies, interested citizens, environmental groups and representatives of related business and educational institutions

· Assembly of a central GIS database for all natural resources in Duluth and parts of the Lake Superior coast. This process will be accomplished by using the library modules for spatial analysis and planning. An advisory committee consisting of potential user groups will be developed to determine direction and scope of the central data base. The advisory group will be drawn from technical experts at the University of Minnesota Duluth, local and state governments, interested planning and development business interests, media, lay people, environmental organizations and local educators. The database will be designed with the idea that it will serve users at number of levels. Users will be able to seek out habitat and natural resource information on both a site specific or system wide basis. The GIS data base will provide ecological linking of module information. It will also be designed with the flexibility to allow for updating as future information becomes available.

· Production of an educational video with an intended audience of developers, policy-makers (when considering a development proposal) and the general public. The natural resources inventory by watershed basin will be used as the focus for BMP techniques and approaches to minimize disruption of the natural resources on the site in question and surrounding land areas and it's impact on the adjacent water course. BMP's that deal with habitat preservation and riparian protection will be introduced in the video to acquaint audience with these types of practices. As an example, this discussion will include reference to state shore land requirements and local floodplain and wetland ordinance provisions.

PRODUCTS:
Baseline Resource Needs Assessment: This document will catalogue all existing data sets to be included in the NRI (e.g., paper, digital, or currently non-existent). It will also contain a prioritization of data to be entered into the modules of the library. Grant funding has been obtained for this initial stage in the development and a Request for Proposal has been disseminated. A contractor was selected to complete the NRI Needs Assement by March of 2000. Data gathered through the needs assement will then be used for the second stage of the process. This information will also be made available to anyone seeking information about community habitat protection or natural resources.

Library of Natural Resources Modules: The NRI will be composed of seven modules. Each module will be a complete package of all available information on a defined unit of natural resource information. The units designated in preliminary development are:

1. Baseline Information - Maps/GIS/Photos
-Baseline maps: roads, political boundaries, watersheds
-Digital Roster Graphic (DRG)
-Digital Elevation Model (DEM)
-Orthophotos - Digital : Satellite TM raw image

2. Wildlife and Fish Habitat and Natural Vegetation Communities
-Communities: important natural and rare elements
-Forests: location, type, size, slope, adjacency to other land uses
-fish habitat
-wildlife habitat
-greenways
-migration corridors

3. Earth Resources: Geology & Land forms
-Bed rock and surficial geology
-Topography
-Soils, flood plains (FEMA)
-Mineral resources (aggregate and rock)

4. Water Resources
-lakes and ponds
-wetlands - types and functions
-streams - classes (headwaters rivers)
-ground water, wells,

5. Vegetation and Land Cover
-vegetation cover and land cover using Metro Land Cover Classification (MLCCS) and National Vegetation Classification (NVCS) categories
-1) Aerial photo and 2) TM (satellite) classifications

6. Land Use
-By use: residential, commercial, industrial
- by zone
-ownership: public (state, fed, local), private
-open space (park, recreation, cemetery,)
-agriculture

7. Historical/Cultural/Aesthetic
-recreational
-scenic
-photogenic
-historically significant
-landmark
-walkways

The current grant application is to develop the modules in the library. Although actual costing and time involved cannot be determined with certainty until the Needs Assessment is complete, based on current information, this grant application is requesting funding to complete seven modules of the library. The order of development and final units may change after the Baseline Source Needs Assessment is complete. Each unit contains maps and support information to allow users to review the natural resource information on several levels. The units will be designed to be used as separate entities or overlapped with other units as needed. Material will be prepared as a CD and as a paper copy to allow maximum usage. Each unit will be reviewed by a volunteer technical committee and will cite resources for further study.

The Inventory has sought assistance from various sources for reducing the costs of these modules. The Storm Water Utility of the City of Duluth has agreed to provide the Library with current surface water mapping, GIS information and overlapping structural capacity. This information is currently being developed by the Utility at a cost of approximately $50,000 as part of a city wide Surface Water Plan. The Utility is committed to developing Surface water information in a format that can be readily included in the module structure.

When complete the modules will be available as a set on CD or in a paper format. The modules will be maintained by the

Duluth City Planning department and be made available to interested members of the public.

GIS Data Base: When all the modules have been complete a consolidated data base will be formed using GIS. GIS is a powerful management tool. Creation of a central GIS database for all natural resources data in Duluth and the North Shore will allow both technicians and lay people to use the NRI data to protect ecosystems, both terrestrial and aquatic. Information to be included: geology, including bedrock and surficial geology; mineral resources, such as gravel and sand; topography; soils; natural vegetation communities (from other sources); habitat for rare and endangered plants and animals; wildlife corridors; extensive tracts of mature forest; wetlands, including types and functional values; creeks and streams; ponds; lakes and groundwater. The completed data will be available over the net or through governmental units.

Educational Materials; The materials developed in the GIS data base and the library will be used as tools for the development of educational material including a video and hard copy educational atlas of natural resources information. The video will address known information and pro-active processes such as BMPs that can be developed to insure sustainable growth in Duluth. The video can be used as a tool for planning and for presenting a variety of information to interested public groups.

Project Milestones:	**Dates:**
Hire Contractor for Project	10/1999
Finish Needs Assessment	03/2000
Complete GIS Modules 1-7 (data layers)	09/2001
Assemble and Test GIS Modules (layers)	11/2001
Produce CD and Web Page	12/2001
Present Product to Local Governments	03/2002
Develop NRI Atlas and Video	09/2002
Project End	09/2002

☒ Project Addresses Environmental Justice

If So, Description of How:

This project will help address the inequities that exist with respect to the protection of natural resources in the middle to lower income areas of Duluth. The project's goal of identifying key natural resources and features should make it possible for these lower or moderate income areas to argue persuasively that locally unwanted land uses (LULUs) should be distributed throughout the entire urban area. The level of attention given to habitat and natural resource identification by the NRI may also be a disincentive for some dirty or polluting industries. This factor, in and of itself, may be enough to insure that local or moderate income residents are not subjected to inordinate levels of pollution or seriously degraded local ecosystems.

☒ Project Addresses Education/Outreach

If So, Description of How:

One of the desired educational components of this project is to simply get policy makers, residents, businesses, and adjoining communities to understand that the land within the city and North Shore are parts of a larger natural system. What this means in practical terms is that we, collectively, have to acknowledge and design human environments with the recognition that these natural systems have limits. For instance, water quality and fish populations in trout streams are directly affected by the amount of impervious surface in a watershed. Studies in the Pacific Northwest indicate that measurable changes in fish populations occurred when watershed impervious surface changed by as little as two percent (Horner, et. al., 1994).

There are a number of environmental components to the project. These components include the number of data layers developed, the number of hits on the web site, and one-on-one or group contacts with public and special interest groups. Production of an NRI atlas and shareware CD are two other tools that will be used to reach a broad audience. Since the printing of this atlas will be costly, the project will endeavor to enlist the media's support to print portions of the atlas in the newspaper. The reason for this strategy is simply to reach the ambitious goal of getting the NRI into every household in the area. However, it may take many more years for these educational initatives to change behavioral patterns of individuals and organizations.

Project Budget:

	Federal Share Requested ($)	Applicant's Share ($)
Personnel:	0	4,085
Fringe:	0	858
Travel:	5,000	0
Equipment:	10,000	0
Supplies:	3,695	1,304
Contracts:	100,000	0
Construction:	0	0
Other:	0	0
Total Direct Costs:	118,695	6,247
Indirect Costs:	1,305	69
Total:	120,000	6,316
Projected Income:	0	0

Funding by Other Organizations (Names, Amounts, Description of Commitments):

Local match funds to support this project include the following:

City of Duluth Stormwater Utility - $4,500.00 (inkind)
City of Duluth Stormwater Utility - $50,000 (contract)
City of Duluth Planning Department - $80,000 (contract)
University of Minnesota - Natural Resources Research Institute - $14,178
Minnesota Department of Natural Resources - $7,300 (contract)
Total = $155, 978

A similar version of this project was submitted through the Sustainable Development Challenge Grant Program to Ms. Janette Marsh. The budget has been changed modestly from that original proposal because of the necessity to expand the program from Duluth to parts of Minnesota's North Shore.

Description of Collaboration/Community Based Support:

Members of the local NRI work group are some of the best examples of long term community commitment to this project. In 1999, the City of Duluth's Environmental Advisory Council identified the NRI as one of two work plan priorities. The EAC agreed that it would be extremely difficult to provide advice on environmental matters without this basic assessment of the state of the ecosystem. This same theme has been echoed by many of the other members on the work group. Many members feel this information so fundamental to good environmental policy that some way has to be found to carry out the NRI. Local governments are also supportive of the NRI because it is a powerful tool to guide land use development and to steer activities to appropriate sites.

The project itself has wide-spread community support. Participants who serve in an advisory capacity to the project include: the Minnesota Department of Natural Resources, the Natural Resources Research Institute, the Minnesota Pollution Control Agency, the Nature Conservancy, the City of Duluth, two key Duluth advisory committees (Environmental Advisory Council and Tree Commission, the St. Louis River Citizens Action Committee, the Audubon Society, Hartley Nature Center, and citizens. The project also compliments the ground work of both the Lake Superior Decision Support System and lower St. Louis River habitat plan. The NRI will take information from both efforts to supplement key sites or areas covered by the NRI.